



## Avviso di Seminario

**GIOVEDI' 8 MAGGIO 2008**  
**ore 15**

**Prof. M. Strikman**  
(Penn State University)

**Terrà un seminario dal titolo:**

**“Three dimensional structure of fast protons and its implications for pp collisions at LHC”**

### **Abstract:**

We summarize the results of theoretical and experimental studies of hard scattering phenomena lepton-nucleon interactions various hard and diffractive phenomena in proton - (anti)proton interactions which reveal two scale three dimensional quark-gluon structure of the nucleon and presence of significant color fluctuations in nucleons. A new dynamical regime of strong interactions between quarks and gluons in spite of asymptotic freedom predicted at high energies is the unitary, or black body regime in the interaction of a small dipole with hadronic matter, due to the increase of the gluon density at small  $x$ . Signs of this effect can already be seen in diffractive interactions of gluon-gluon dipoles at maximum energies achieved in ep collisions at HERA and in deuteron- gold collisions at RHIC. In ep scattering at higher energies, this effect leads to the disappearance of Bjorken scaling. In hadron-hadron scattering at LHC energies and beyond (cosmic ray physics), this effect will be a standard feature of the dynamics, with numerous implications for i) hadron production at forward and central rapidities in inelastic central pp and pA collisions, in particular events with new heavy particle production (Higgs, etc), ii) pp elastic scattering, iii) multijet production.

**Sala Riunioni - Dipartimento di Fisica**

**Il Direttore**  
**Dr. Pasquale Lubrano**